VOLUME 29, NUMBER 1

MOVABLE STATIONERY

In this issue:

Unboxing Structural Graphics

IN THIS ISSUE

For a change of pace we thought it would be interesting to examine the state of the art of paper engineering *outside* the traditional publishing world. Come with us to Essex, Connecticut, a small town where huge things are imagined every day. ■ And who doesn't love the story of Noah's Ark? Countless children's books have examined this favorite Bible story. But one paper engineer rose to new heights with his take on the iconic tale. ■ Speaking of the state of paper engineering, the pandemic and global downturn has had a *temporary* depression on our industry, we believe. For the first time we can remember, we could not find *ANY* new movable books released this quarter. But fret not, we are on the scent of a bevy of delightful treats heading our way. Hopefully next issue!

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Cost limits achievements in commercial pop-ups much more than imagination. Our current slump in trade publishing might be due in part to increasing production costs. But what happens when this pressure is significantly diminished, allowing imagination to soar? You'll find out in this issue's feature article about Structural Graphics. Editor Bruce Foster showcases a company that joins great creative minds with well-researched production strategies and the resources of serious industry. It's no surprise that, as Foster writes, the Golden Age of Pop-Ups began with advertising. Let's take a moment to celebrate the engineering achievements that take place outside of traditional publishing.

Shawn Sheehy, Director, MBS

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This page: The request to Structural Graphics was for something that had "never been done before." With an LCD heart monitor and two completely independent electronic units in one magazine unit, this interactive pop-up magazine insert combines multiple sensory touch points including a physical interaction with door handles, illuminating LED lights, and visuals that appear on a LCD screen. When consumers place their thumbs on the door handles, they see the heart icon, then their pulse line, followed by an audible "beep" interacting with the pulse imagery. A leather scent was also added to create a literal sight, sound, touch, and smell interactive experience.

Cover: A mysterious surprise sent to unsuspecting influencers as a promotion for Google's new store and products.

Pop-Ups are NOT just fo

BY BRUCE FOSTER AND MICHAEL DAMBRA

Quick! When you hear the phrase "pop-up," what comes to mind? A book? A greeting card? A temporary restaurant? But seriously, as all we members of the Movable Book Society know well, not all paper pop-ups are geared toward children.

As a matter of fact, the Golden Age of pop-ups of the 1960s actually began not with children's books, but with advertising magazine inserts and other business-to-business endeavors by **Wally Hunt** and **Ib Penick's** ***Graphics International*** and later, ***Intervisual Communications.*** That legacy endures today at **Structural Graphics,** the spiritual and actual successor to those innovative marketing companies.

Founded in 1976 by **Chris Crowell,** an entrepreneur whose love of paper and print advertising collided with his fascination with the origami-like folds of children's books. While appreciating the power they had to capture and hold attention he was especially taken by

Structural Graphics designed and produced this miniature paper replica of CARESTREAM's Touch Prime Ultrasound System for The Verdi Group.

or kids

Structural Graphics

Founder Chris Crowell

An example of a pop-up magazine insert featuring Joe Camel.

the entertaining way that they did it. He understood children's books were accomplishing exactly what print advertisers were trying to do—interactively engage a reader with a message. That was the crux of the idea that started Structural Graphics.

In short order Structural Graphics was working with brands including American Express, BMW, HBO, Pfizer and Proctor & Gamble, just to name a few, plus every major advertising agency on the planet. Dimensional marketing was performing well – so much so that in 1983 tobacco giant RJ Reynolds tapped the company to produce umpteen million Joe Camel magazine inserts.

In the early days, then creative director and paper engineer **Frank Ossmann** would design in pencil, taking Xacto knife to paper to painstakingly build prototype after prototype. Once a working model was achieved, the challenge of how to produce hundreds, thousands and eventually even millions came into play. But a unique paper sculpture was only useful if it could be mass produced affordably.

For the designers at Structural Graphics, having artistic talent is just a beginning. They need to know printing and paper strengths, adhesives and fasteners, postage rates and weights, book and magazine binding, and countless other facets of the industry that can make or break the viability of their creations ever seeing the light of day.

The overwhelming majority of the Structural Graphics designs throughout its history have required skilled hand labor. The need for hand assembly created a need for skilled workers, which in turn required training, and practices and protocols to follow. Early on Frank and his staff were challenged with establishing assembly instructions, adhesive designations, and setting timing standards. No one at that time was doing skilled hand work with paper, so SG built the resources themselves. They trained local workers, many who would bring die cut materials home to assemble. When domestic labor costs made hand assembled pieces unaffordable, the company expanded its operation and opened its own hand-assembly plant in Piedras Negras, Mexico. This is the model which still operates today.

Frank Ossmann with staff paper engineer, Betsy Morgan

Much has changed in 45 years. In the 90s the company was purchased by members of its current management team, **Mike Maguire, Ethan Goller, Tom Saltonstall,** and **Michael Dambra.**

Then in 2006 Structural Graphics expanded by purchasing one of its primary rivals, Santa Monica, California, based **Intervisual Communications.** Doing so gave them an instant footprint on the ground on the West Coast with a full staff

This amazing "X-Ray" viewer is one of many innovative mechanisms created by the paper engineers at Structual Graphics.

LET'S PARK IT ON OUR DESK. Let's drag race our favorite pen. Let's blow past the tape dispenser. Let's avoid coffee spills. Let's not get pulled over by our boss. Let's get lost in the office. On a 1/56th scale - LET'S MOTOR.

Crispin Porter + Bogusky engaged Structural Graphics to design these "Perf and Build" replicas of BMW's newly launching "MINI" brand. No two perf-outs were identical, and each of the fleet of 12 was its own unique die, to as accurately as possible replicate the nuances of each individual model. The insert ran in six publications and over 10,000,000 units.

I went to SG for help in manufacturing this holiday pop-up catalog for ***Pier1*** *and was invited to visit their assembly plant in Piedras Negra, Mexico. There I witnessed the hard-working, proud, professional crew in action. Presently SG is producing my design of a pop-up book for* ***St. Jude Children's Hospital.*** *– Editor Bruce Foster*

of designers, sales and production experts as well as a patent on the ever-popular Flapper design, along with a handful of machine-fed designs for large, high speed magazine inserts. The company has since reinvented itself more than once to ride the waves of economic booms and busts and adjust to the effects technology has had on:

The process: Designing with pencils and Xacto knives has been replaced with the Adobe Suite powering plotters driven by an engineering-based Auto-Cad system.

The designs: More and more SG designs are incorporating technology that allows marketers to better connect with their target audience. Video mailers are now among the company's most popular products. NFC tags and augmented reality triggers are woven onto dimensional paper pieces that marry offline with online by using a Smartphone.

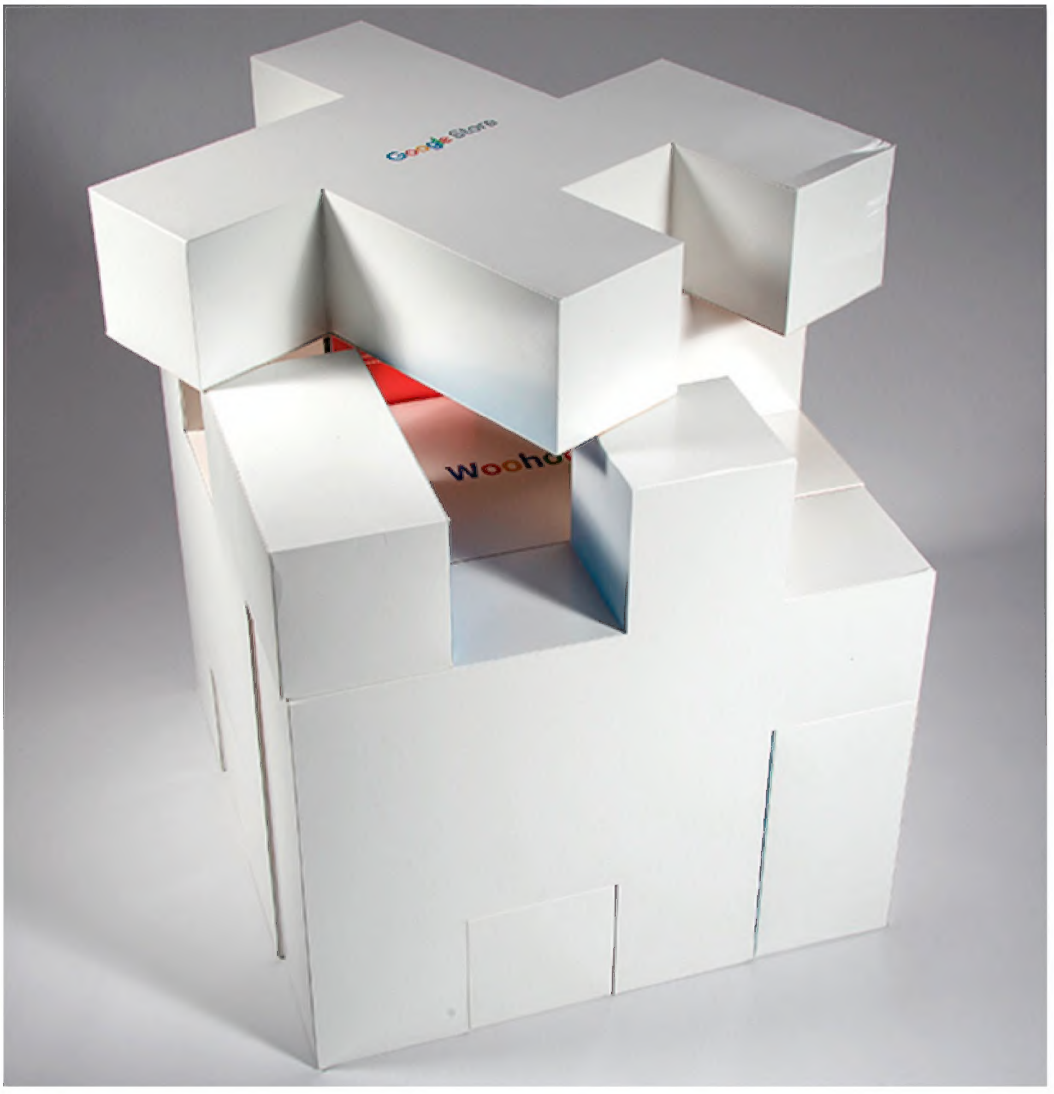
The market: The advancement of data has seen huge-run magazine inserts and mega-sized mailings have given way to highly targeted mailings to niche market segments.

The Flapper mechanism, acquired from the purchase of Intervisual Communications is one their most popular and versatile structures.

*SG continues to be on leading edge of interactivity in print with this special packaging for **Kellogg's** and their agency, **Creata.***

*Watch the design process beginning to end featuring the entire SG creative team in action while developing this movable book for **Google.***

Google Store


Google Store

*SG designed this launch kit for **Google's** "Unboxing Event" which was used to promote their new store and products. The boxes were designed like a puzzle with each piece carrying a different product. Then they were sent as a surprise to major influencers who then vlogged and posted videos of the box on YouTube.*

Left from front to back:
Jenna Paternostro
Noel Boland
Erik Hluchan
Dylan Ficke
Tom Saltonstall
Stacy Zaid

Right from front to back:
Ethan Goller
Leslie Harrison *(seated)*
Kevin Gilligan
Kerry Davies
Julie Kerop
Betsy Storms
Joe Migliaccio

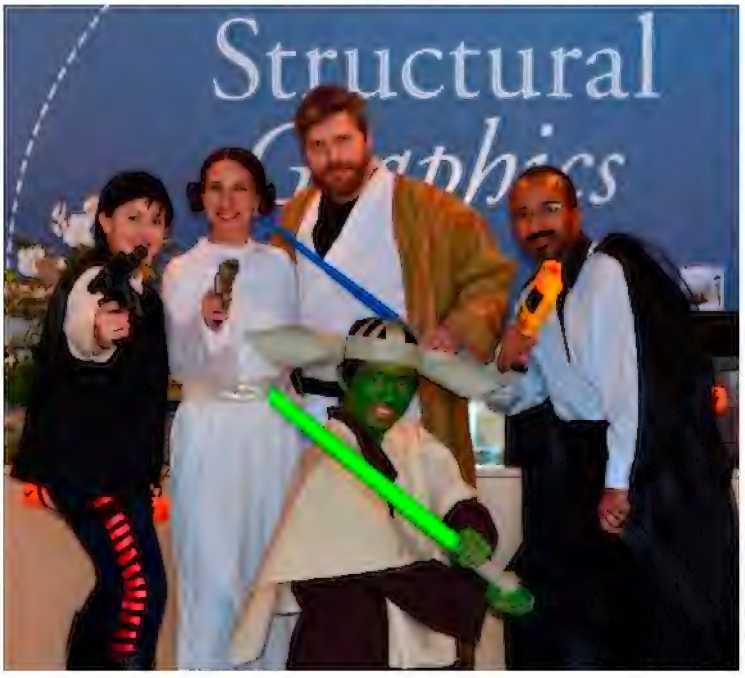
Center:
Michael Dambra

For marketers, Structural Graphics has always maintained its position as the world's leading resource for extraordinary paper inventions and communications tools. For designers, it is a creative laboratory where inventions are inspired by marketing challenges and perfected under business-driven deadlines. Structural Graphics is the breeding ground for innovative artists with both the talent and the discipline to become paper engineers. This group has included **Frank Ossmann, Betsy Morgan, Erik Hluchan,** Mikos Malkovas, **Alex Bates, Gina Block,** Rob Kelly, Isabel Uria, and Wai Yin Kwan (the latter three are contributors to MBS' ***AtoZ: Marvels in Paper Engineering,*** and Isabel, who also is currently serving on the MBS Board of Directors). With an eye on the future, new talent is nurtured with such newcomers as Shin Wakabayashi and **Dylan Ficke.** Their work has built a company resume filled with historic firsts, patented inventions, and groundbreaking designs.

But first and foremost, Structural Graphics is a family. Amid all the deadlines and stresses of business, they strive to maintain a sense of community and fun. As Structural Graphics' president, Ethan Goller, told me, "its part of our mission statement: not taking ourselves too seriously."

We would add, though, seriously talented and innovative.

Visit Structural Graphics at *StructuralGraphics.com* to explore and discover so much more of their wonderful paper creations.



Above and to the right: SG paper engineers ***Isabel Uria, Erik Hluchan, Shin Wakabayashi, Alex Bates,*** *and Director of Design and Engineering,* ***Noel Boland.***

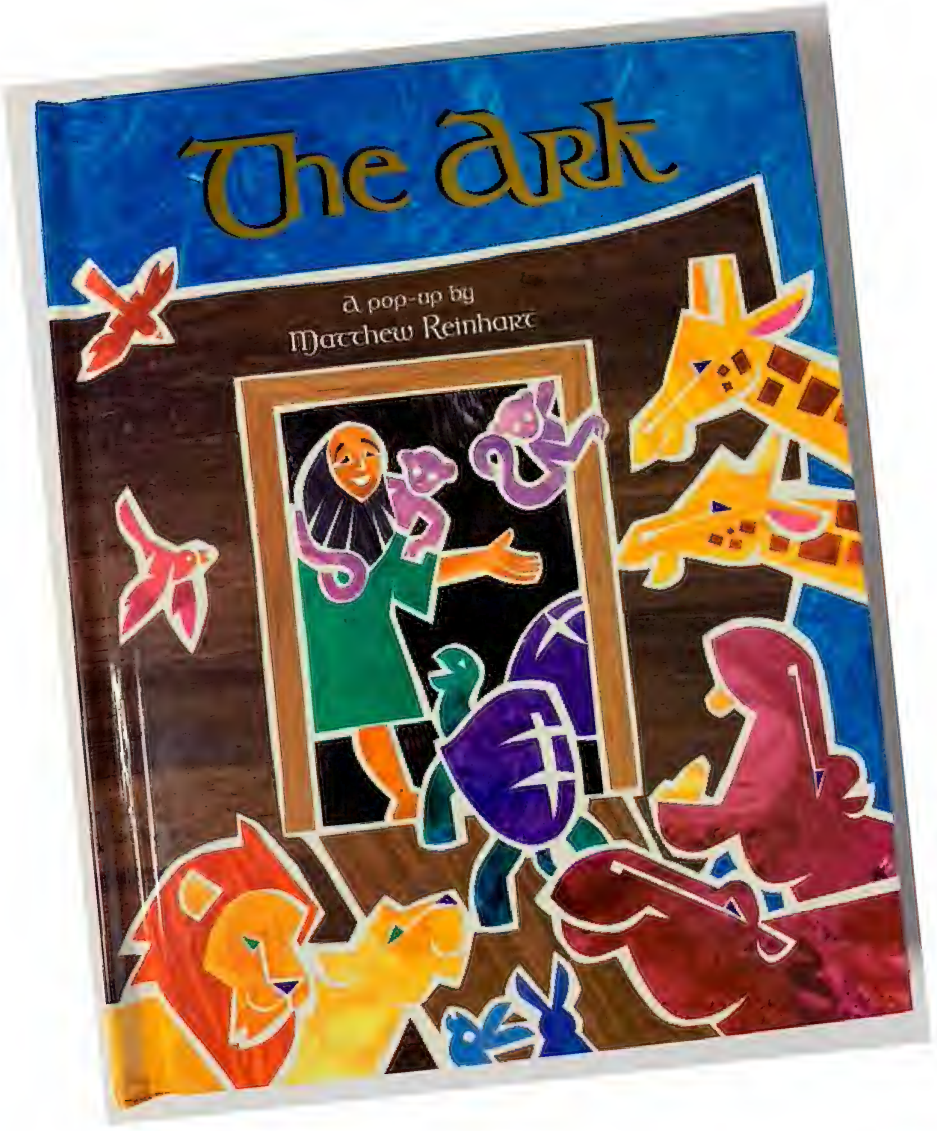
The charming (and charitable) staff of Structural Graphics on ***Red Nose Day,*** *a fundraiser that supports Comic Relief.*

redpaperplane® by Structural Graphics

Breaking through the boundaries of the flat printed sheet can be an exhilarating experience for any designer - and with Structural Graphics' latest venture, Red Paper Plane, that experience is easily available to everyone. Red Paper Plane is their ecommerce website. It is stocked with over one hundred of Structural Graphics' most requested and successful designs. Each is design-it-yourself ready on easily downloadable templates making it possible for any designer anywhere to work dimensionally simply by picking a design, downloading the template, and placing art.

When the Ea
mankind became selfish
raged across the land a
only of themselves. hun
without regret. Kindnes
long been replaced by
and pain.
God was saddened
His creations. Man had
God and grown deaf to
realized all humanity w
one man.
Noah was a simple a
cared for his wife and ra
Shem, Ham, and Japhe
were grown and had wi
Noah worked hard to p
family and lived by God

Illustration 1: spread 1: before the flood



Reinhart's Ark

BY PAUL JOHNSON

Of all Bible stories, Noah's Ark must surely be the one that has most inspired pop-up book creators. **Matthew Reinhart's *The Ark*** (Simon and Schuster, 2005) is constructed with the complexity of the original ark, but in paper, not wood. Each of its six spreads has a different design concept and engages the viewer by employing myriad engineering techniques. There are additional gatefold pop-ups on all but the last spread, but for the sake of brevity I have not included these in this overview.

In spread one – a pastoral scene – is a low relief pop-up viewed vertically (Illustration 1). The buffalo keeper in the

Diagram 1a

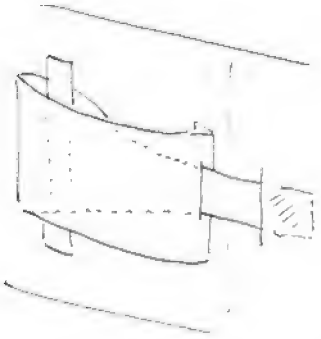


Diagram 1b

foreground is barely lifted off the surface, but a curvaceous peasant's hut placed at the top of the page rises higher. 3D curves are problematic in pop-up engineering but let me attempt to encapsulate the technique used here. The right side of the hut is glued down near the gutter crease. A long strip extends from its left side (Diagram 1a). This is folded back, passes behind a "post" and becomes the far side of the hut interior; it then narrows, travels through a slot on the huts right edge, and passes over the gutter. Finally, the strip travels through a slot on the facing page and is glued down (Diagram 1b). The action of opening the spread pulls the hut against the post and so it is raised into a curve. When closing the spread the hut is pushed away from the post and so it flattens. To camouflage the mechanism Reinhart places a shepherd and his sheep over it. (We will see later that pop-up book designers use other techniques to hide structural necessities.)

The ark itself nearly fills the second spread and is viewed horizontally on the spread. Like walking around the outside of a building we have to turn the book 360 degrees to see the floating craft in its entirety. This technique is a favorite with pop-up engineers and needs an article dedicated to its construction, so here I take just one small part of it to examine. A gangplank, like a child's slide, rests on the ark's doorway, but how can you make a diagonal – like the hypotenuse of a triangle – fold down flat? A way is to do it as here: the top of the gangplank is the only part of it that is attached. As the spread closes its bottom end slips through a slot on the base (the ground) and is hidden beneath it (Diagram 2).

The third spread like the first one, is viewed vertically, but is much more elaborate in design. A gangplank – a minor pictorial item of spread two – is the main feature of this design rising to nearly seven inches high. I say "rising" but as it is a vertical design the gangplank appears to be coming out towards us as the animals enter the ark.

It is worth commenting here on one of the basic assembly techniques found in most pop-up books. There are two main ways of joining a pop-up form to another one or to its base. Most simply a tab at the bottom of the form is folded to a right angle and glued down (Diagram 3a). Sometimes this tab is part of the design; the wolf's foot on spread five exemplifies this and so we see the tab as artwork not as a means of attachment. In an attempt to hide the tab it can be folded backwards (Diagram 3b). Another technique, and one that renders the tab invisible is by pushing it through a slot on its receiving surface, folding it to a right-angle and gluing it to the reverse side (Diagrams 3c/d). The elephant's legs on spread two demonstrate this method, but it can be found throughout the book. However, there is another slotting method, but it can only be used if the pop-up form is not attached to the base. If you look

Spread 2: the ark

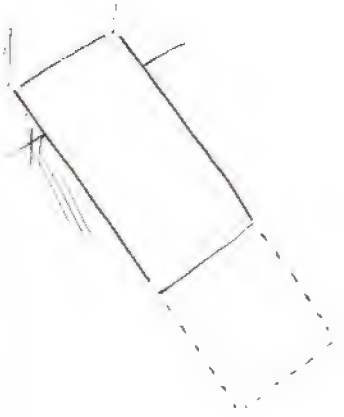


Diagram 2

Diagram 3a

Diagram 3b

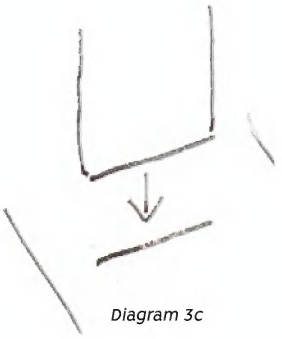


Diagram 3c

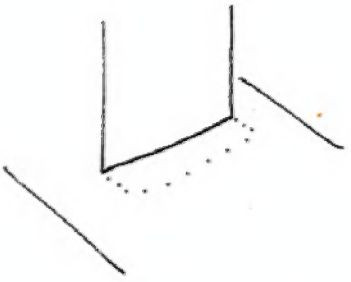


Diagram 3d

Illustration 2: boarding the ark

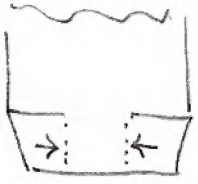


Diagram 4a

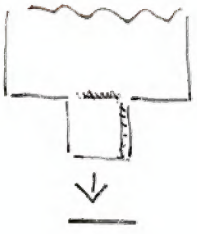


Diagram 4b

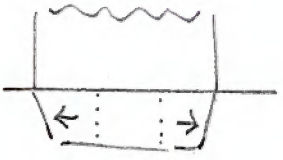


Diagram 4c

underneath the gangplank on spread three you will see that there are tabs holding the animals in place (illustration 2). These are free standing – not glued – and in three parts (Diagram 4a). The side sections of the tab are folded over the middle section (Diagram 4b). It is then pushed through a slot on the receiving pop-up form and the side sections opened back, thus firmly locking the pop-up in place (Diagram 4c). This technique has two advantages over the previous methods: as the tab is not glued down the pop-up moves more freely, and "paper fatigue" is avoided – there is no risk of the fold separating through continual folding and unfolding.

Spread four is a vertical base relief pop-up like the first one, but the bucolic theme of the introduction has now become the terrifying scene of the earth's flooding (illustration 3).

Spread five – the ark interior – integrates vertical and horizontal characteristics. Reinhart ingeniously juxtaposes the

With a mighty roar of thunder, the waters of heaven broke free and flooded the Earth.
Hoping to find safety, the villagers who had once laughed at Noah now begged to come inside. But it was too late, for the great Ark was carried away by a powerful wave. The waters of the Flood spilled across the land, destroying everything in their path.
For forty days and forty nights the rain continued. The Ark rocked helplessly in the crashing waves of the mighty Flood.

Illustration 3: the flood

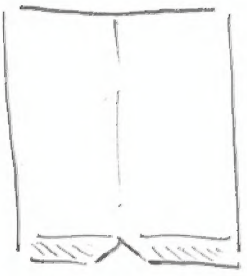


Diagram 5a

Illustration 4: safe on land

Everyone aboard the great Ark rejoiced with the news. Noah's sons opened the door of the Ark and the creatures returned to the Earth. Upon dry land, Noah, and his family prayed and gave thanks to God for keeping them safe.
God looked down to them and said, "I shall never again flood the Earth with water.
"Let this rainbow be a reminder of my promise to you." As God spoke, a shimmering band of color arched across the sky. "Now go forth and multiply."
So Noah and his family followed God's words. Soon the Earth was filled with their children and their laughter.

seventeen separate units of this composition so that nothing overlaps or is partially concealed. The low relief animals and figures in the foreground contrast with the camels and eagles that rise from the top edge of the spread.

He matches the changing moods of the story with corresponding pop-up techniques. The animals surging into the ark (spread three) and then later out of it (spread six) are expressed with engineering complexity whereas the familial scenes of episodes 1 and 5 are relatively "quiet" in engineering terms.

Contrast – horizontal with vertical, big with small, light with dark, primary colours with secondary colours, active with passive, complexity with simplicity – is necessary in all art forms and Reinhart does it skillfully on every page. Is this knowingly done, or is it the unconscious product of the artist's imagination and intuition? A combination of both I would guess.

Spread six represents the triumphant ending of the story as Noah's family and the animals step back on to dry land (Iillustration 4). The structure – commonly found in pop-up books – is a "v" form rising diagonally off the base. (Diagrams 5 a/b) show it in its basic perpendicular form (this is exemplified by the gangplank on spread three). (Diagrams 6 a/b) shows that by changing the angle of the glue tab the pop-up leans backwards. This effect is put to good use in this final spread where the design concept is like an ancient Egyptian step pyramid. As it tapers to the top this epic scene is crowned with the ark sitting at its crest.

The slanting "v" form has many different applications; the thunder and lightning on spread four is a dramatic realization of the technique. As the spread opens and closes, storm waves and clouds rise and fall; the ark tosses. With the step pyramid the style is in its solid terra firma form, with the storm scene it is at its most vibrant and dynamic.

As I was writing this article I became aware that I was only scratching the surface of identifying the techniques used in this book. On a rough count it contains over eighty separate

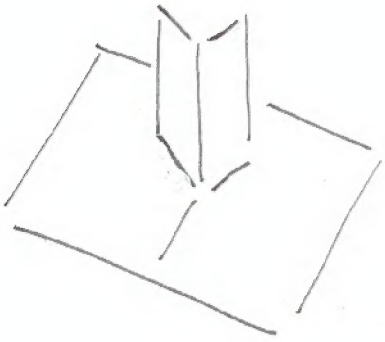


Diagram 5b

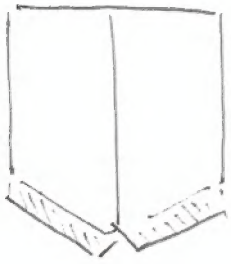


Diagram 6a

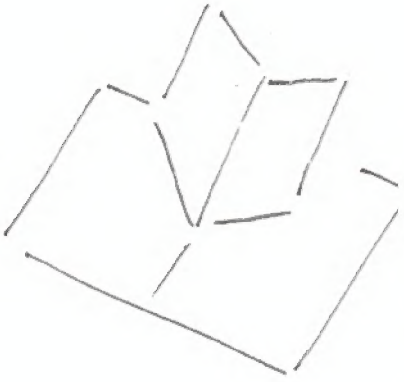


Diagram 6b

units (and this does not include gatefold pop-ups), each one attached to, and interacting with at least one other unit. One important technique I have omitted is the function of the diagonal crease to create movement – like the moving legs of the buffalo keeper on spread one – but this technique, like the cuboid structure on spread two will need an article dedicated to it.

In previous articles I have alluded to the most sophisticated of pop-up books being analogous to music. This book is like this for it is symphonic in form, with an introductory *allegretto* (pastoral scene), a fugue – *moderato* (the ark), an animated *scherzo* (the animals entering the ark two by two), a vigorous *allegro con fuoco* (the storm), a slow movement – *lento* (a domestic scene inside the ark) and the last movement – *presto con brio* – the story's climax. Did Matthew Reinhart have Beethoven or Mahler's symphonies in mind when he conceived The Ark? Unlikely, I think, but it's a nice idea.

A few years ago, while I was running workshops in New York, **Ed Hutchins** kindly took me to the then **Sabuda/Reinhart** studio in Manhattan. I had imagined that it would be one of those vast converted lofts you see in the movies, so was taken aback when I walked into a small room in the corner of which sat Matthew Reinhart cutting out collage for the book he was engaged with. I must have stopped the two masters of the craft from working, but they were exceptionally welcoming and easy going. Like all experts, they made what they did look so easy. It was somehow gratifying to observe that some of the most innovative pop-up books of our time were created in a small room that had the relaxed ambiance of a family sitting around the kitchen table on a Sunday morning and having fun with paper.

POPPITS

by Ellen G.K. Rubin

Please be aware of new membership dues. Notifications coming soon.

EXHIBITIONS/ BOOK FAIRS

Check out the exhibition at the Baker Library/Harvard University, *The Art of American Advertising: 1865–1910.* Mechanical advertisements are included.

Another exhibition, at the Bodleian Library, England, also centers on advertising, *The Art of Advertising,* with an on-line blog and a door-stopper of a catalog. Everything you wanted to know about advertising and more!

We must be on to something because The Popuplady is scheduled to mount an exhibit at the Grolier Club, New York City, entitled: *Premiums, Promos, and Pop-ups: Selling it with Movable Books and Paper.* The exhibit is to open November 30, 2022. Think that's far away? She doesn't! Stay tuned!

Another virtual book fair, *Amorlibrorum,* ably run by Getman, will be on April 3, 2021 on Paris time.

And another one, Washington, D.C. *Antiquarian Book Fair,* April 9–12, 2021, opens at 12PM EST.

The schedule of future Getman virtual book fairs is here.

MULTIMEDIA

The next Movable Book Society International Zoom event will be on Saturday, May 22, time and headliners TBA. The Popuplady will show the final segment of the video on pre-1800 movable books from her collection. By subscribing to our website, (enter your email at the bottom of the page) or following us on our Facebook page, you can receive a log-in and join in the event FREE. Headliners and participants will be announced on Facebook and on the MBS website.

This year is the 700th year of the death of Dante Alighieri. In commemoration, Alfredo Podestá, has made 19 3D cards, contained in a collection box, dedicated to iconic characters and rivers of hell. Each card includes the removable figure of the character. In addition, the box also contains a twentieth special card that offers a telescopic view of Hell in the form of a long resealable tunnel.

McGill University, to celebrate the 200th anniversary of their library, has created a pop-up book, *AMAZE: MCGILL A TO Z.* Each letter represents a section of the special collections library. The paper engineers were Ian and Alison Smith from Bristol, England. In a video within a video of the Zoom conference where the book was launched, the Smiths show our Brooklyn Pops Up as an example of their work. Ian did the Brooklyn Bridge using acetate in the book. The Smiths go through the entire design of A to Z which is available for sale on the McGill University website.

The 1 hour video from the Zoom book launch is here.

SAVE THE DATE

2021 Denver Conference

September 30 – October 3

Magnolia Hotel Denver

Keynote Speaker: **Suzanne Karr Schmidt**
Curator of Rare Books and Manuscripts at the Newberry Library, Chicago
@DrKarrSchmidt

Conference Highlights

Attend in person **OR** virtually online.
15 presentations featuring historians, paper engineers, conservators, and more.
Exhibition reception at the Art Students League of Denver.
The Book Fair, Show-and-Tell, Open Mic.
The Announcement of the Meggendorfer Prizes.
Most dinners and lunches provided.
plus:

The first 150 to register (on-site or virtual participation) will receive a free copy of *One Thousand and One Handbags*, a pop-up book collaboration between best selling author and paper engineer David A. Carter and acclaimed Dutch shoe and handbag designer Hester van Eeghen. Special edition available for purchase here.

Stay up to date at movablebooksociety.org.
And the link to register will be live SOON.

MOVABLE STATIONERY

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